within the experimental error of sampling and analysis. The total organic carbon has markedly increased in the cropped soil. The "humus" has remained practically the same except on the alternate cropped and fallow plot where a decrease has occurred.

The yearly yields of the plots since the beginning of crop production on this farm are recorded in Table II.

TABLE II. YIELD OF WHEAT ON PLOTS CROPPED CONTINUOUSLY AND ALTERNATELY CROPPED AND SUMMER-FALLOWED

Yield of wheat reported as bushels per acre

Plot No.	1904	1905	1906	1907	1908	1909	1910
82	17.75	8.9	17.9	16.5	13.4	14.58	7.8
83	15.16	fallow	35.6	fallow	32.7	fallow	9.9

The alfalfa plot was utilized for experiments in alfalfa seed production. No yield of seed was obtained. The seed experiment was discontinued in 1908. In 1909 a yield of 2,775 pounds of hay was obtained. The crop failed to mature in 1910.

With respect to the characteristic cultural methods in vogue in Utah, it may be noted that one of the reasons why the grain is harvested with the header is that the straw is so short that it is difficult to use a binder. Wherever a binder is used, the straw is of a ranker growth which permits its use. Now, this being true, it is very doubtful if there be more straw in the stubble on dry-farming land in Utah where the header is used than in the stubble on land where the ranker growth of straw permits the use of the binder. The writer confesses that he knows of no accurate data upon this point.

The explanation of the noted increase of humus and nitrogen in the dry-farming soils of Utah must be sought elsewhere. The effect of the cultural methods, while not of paramount importance, is a possibility which ought not to be ignored. In many sections of the country, such as the Mississippi valley, there is a sharp line of demarkation between the surface soil and subsoil, due to the accumulation of humus in the surface soil formed from the decayed roots of the native grasses and the addition of their residues. The marked change in color of the subsoil indicates that the roots of the native grasses have not penetrated to greater depth. In the soils of Utah, no such line of demarkation occurs between surface and subsoil, which clearly indicates that the roots of the native vegetation have penetrated to great depths. The significance of the deep-rooted character of native plants in arid soil was first noted by Hilgard.[7] The characteristic native vegetation of the dry-farming soils of Utah is sagebrush, the roots of which penetrate to great depths and, being of a woody nature, do not undergo decay rapidly. The foliage is very scant and adds little to the humus-forming material of the soil. The native grasses occasionally occurring with sagebrush are also deep rooted. In a word, there is limited possibility for the formation of humus in the virgin surface soil as compared with other sections of the country where the root system does not penetrate so deep and the native vegetation of a humus-forming type is more abundant. Therefore, in the dry-farming soils of Utah, the addition of *any* straw must increase the organic matter of the plowed surface of the soil as compared with the virgin surface soil which receives little or no organic matter of a humus-forming type. The other factors as noted in Bulletin No. 109 should also be considered in connection with the increase of nitrogen and humus in the cultivated soil.

ROBERT STEWART
CHEMICAL LABORATORY,
UTAH EXPERIMENT STATION

[7] "Soils," p. 174.

THE AMERICAN CHEMICAL SOCIETY. III

DIVISION OF INDUSTRIAL CHEMISTS AND CHEMICAL ENGINEERS

G. D. Rosengarten, *chairman*
F. E. Gallagher, *secretary*

The Rapid Analysis of Alloys: GUILLERMO PATTERSON, JR.

The Testing of Inks, Typewriter Ribbons and Carbon Papers: PERCY H. WALKER.

Hop Standards: Considered from the Chemical Standpoint: H. V. TARTAR.

Losses in the Storage of Coal: HORACE C. PORTER and F. K. OVITZ.

The paper describes tests made by the U. S. Bureau of Mines at various points during the last three years to determine the loss in heating value and the physical deterioration of several kinds of coal while in storage. Tests at various U. S. Navy Yards (Portsmouth, N. H., Norfolk, Va., and Key West, Fla.) and at the Pittsburgh station of the Bureau, on New River (W. Va.) coal, have been carried on for eighteen months both in the open air and under water, so as to show the amount of the saving accomplished by the latter method. Pocahontas coal has been stored in the open air on the Isthmus of Panama for nine months, and is being tested to show the deterioration of this grade in a hot climate. Pittsburgh gas coal has been stored in open bins exposed to the weather at Ann Arbor, Mich., and also submerged under water, so as to determine both the loss of heat value and the deterioration in gas-making qualities (the latter phase of the investigation being under the auspices of the University of Michigan and the Michigan Gas Association). Sheridan (Wyo.) sub-bituminous coal (black lignite) was stored in outdoor bins at Sheridan, Wyo., for nearly three years, and the amount of deterioration and slacking under different conditions determined.

The results show briefly that deterioration in the open varies considerably with the kind of coal, the Appalachian coals being only slightly affected while the younger coals of the west, which differ from the Appalachian in their chemical character, are more easily oxidized and weathered.

New River coal loses less than 1 per cent. in heating value during open-air exposure for one year, and no loss at all occurs during storage under water. The wetting of the coal by submergence reduces its evaporative power more than enough to offset any saving accomplished through the prevention of deterioration. The only advantage of submergence in case of this coal, therefore, is the avoidance of all risk of spontaneous combustion. Fine coal deteriorates more in all cases than run-of-mine.

Pocahontas coal, during nine months' open-air storage at Panama, lost only 0.3 per cent. in heat value. Sheridan, Wyo., sub-bituminous lost 3–5 per cent. in heat value during three years' storage in outdoor bins and slacking penetrated only about one foot from the surface. Pittsburgh gas coal stored in outdoor open bins lost nothing in heat value during the first six months.

Need of Professional Code of Ethics among Chemists: LUCIUS P. BROWN.

Storage Battery Efficiency: J. S. STAUDT.

A New Modification of Gas Analysis Apparatus: B. G. KLUGH.

Refractories and Laboratory Appliances made of Alundum: P. A. BOECK.

The rapid advance in high temperature work and furnace construction during the past few years has necessitated the development of a high-grade refractory material to withstand excessive temperatures. Electrically fused alumina has long been known to have exceptional refractory properties, but on account of the difficulties in the manufacture of articles of this material its use has been limited. Fused alumina under the trade name of "alundum" has been made for abrasive purposes for the past ten years by the Norton Company, Worcester, Mass., who have lately adapted this material for refractory purposes.

There are two varieties of fused alumina or "alundum" made.

One is a dark, brown, dense vitreous body having a density of 3.9 and a hardness between corundum and diamond. This is made by calcining bauxite and fusing it in a water-cooled electric furnace, where the impurities in the form of iron oxide, silica and titanium oxide are reduced to a considerable extent, leaving the material in the furnace 92 to 95 per cent. alumina. The other is a material of higher purity, containing more than 99 per cent. alumina, made by carrying the purification process further. This is the material most generally used for refractory work.

The alundum comes from the furnaces in pigs weighing about five tons each, which are broken up, crushed and graded to grain of a uniform mesh. In making refractories of this material grain of a suitable size or combination of sizes is mixed with a refractory bond of a ceramic nature and the pieces molded, pressed or cast into shape and fired at high temperatures. The kind and amount of bonding material, and the size or combination of sizes of grain used, are varied to give properties to suit the conditions under which the articles are to be used. In this way their properties may be modified or controlled to adapt them to any refractory use. Attempts have been made to make articles of cast alundum, which have been only partially successful.

The physical properties of bonded alundum refractories are as follows:

High Melting Point.—Between 1,950 and 2,100 degrees Centigrade.

High Thermal Conductivity.—2.1 times that of vitrified firebrick and 1.6 times that of porcelain.

Low Electrical Conductivity.—Even at elevated temperatures it is a better insulator than porcelain.

Low Thermal Expansion.—This is linear and varies between .0000085 and .0000059.

High Mechanical Strength.—This can be varied and is dependent to a certain extent on the other properties desired.

Porosity.—This can be varied between wide limits from impervious bodies to those having a high porosity which can be used for the filtration of liquids of any gravity.

Filtering crucibles of the gooch type can be used for filtering precipitates quantitatively without any previous preparation and can be used repeatedly.

Extraction thimbles are made for all kinds of extraction work and can be cleaned by igniting over a gas burner.

This material is especially useful in small wire wound resistance furnaces, as it prevents overheating and corrosion of the resister and has high thermal conductivity.

Crucibles for analytical work of a general nature such as drying and burning filter papers, coal analysis, etc., have been found more rapid and longer lived than porcelain. Crucibles for melting platinum and high melting alloys, where no slags are present, have been found very efficient.

Combustion boats of alundum are useful in the determination of carbon in steels, as the iron oxide formed does not combine with the alumina at the temperature of combustion. For very high temperatures it has been found advisable to use a lining of specially prepared carbon-free alundum between the boat and the sample. When used in this way the boats last indefinitely, as many as 500 combustions having been made in the same boat.

The Determination of Vanadium in Vanadium and Chrome-vanadium Steels: J. R. CAIN. (*Bull. Bur. Standards*, 7, No. 3, p. 377; *J. Ind. and Eng. Chem.*, 3, July, 1911.)

Various errors in the usual methods for determining vanadium in steel are pointed out and in a few cases methods for correcting or eliminating these are indicated. A new method based on precipitation of the vanadium by cadmium carbonate followed by electrolysis, reduction and titration, is described.

Determination of Dust in Blast Furnace Gas: L. A. TOUZALIN.

Dust determinations can be made in any blast-furnace gas at any stage of its passage from the furnace to stoves, boilers or cleaners, if proper means are used to insure the correct rate of withdrawing the sample from the gas main. When samples are withdrawn through a sampling pipe at a velocity less than that in the main, high results will be obtained. Conversely, when the sampling velocity is too great low results are obtained. By means of the proper apparatus, described in the paper, very satisfactory efficiency tests may be run on a system of gas cleaners. This leads to the development of changes in construction which often have a remarkable effect on such efficiency. The apparatus described and the method of operating the same are in constant use at the South Works of the Illinois Steel Company.

The Examination of Fir Oil obtained by Steam Distillation of Douglas Fir: HENRY K. BENSON and MARC DARRIN.

The Wood Distillation Industry of the Pacific Northwest: HENRY K. BENSON.

Ratfish Oil as a Paint Material: HENRY K. BENSON and WALLACE ESHLEMAN.

Note on the Analysis of Nitrous Oxide: WARREN R. SMITH and EDWIN D. LEMAN.

On attempting to analyze nitrous oxide as supplied in cylinders in the liquid state, we found ourselves confronted with certain difficulties. Consecutive samples of the gas as drawn off from the cylinders will vary somewhat in composition, apparently for the reason that the impurities (oxygen and nitrogen) are in solution in the liquid nitrous oxide, and sample of gas as drawn may or may not have reached a state of equilibrium with the liquid. This evidently will depend on the rate at which the sample is drawn, the length of time elapsing between drawing samples, and various other factors. Duplicate results can easily be obtained from a sample large enough for several analyses, but there is no certainty as to what such a sample represents. Again there is a regular progressive change in the composition of the samples as drawn from the cylinders. The impurities escape at a more rapid rate proportionally than the nitrous oxide in which they are dissolved, and the nitrogen escapes faster than the oxygen. Below are three sets of figures obtained from the same cylinder of material.

	True Content of Cylinder	Nearly Full	Nearly Empty
Per cent. O_2	1.4	2.9	0.7
Per cent. N_2	5.2	11.2	1.6
Per cent. N_2O	93.4	85.9	97.7

We found that all these difficulties can be avoided by the simple expedient of inverting the cylinder and drawing a sample from the bottom of the liquid. That this method gives a fair sample we have proved by drawing a sample in this manner and comparing the result obtained from this sample with that obtained by taking samples at regular intervals during the escape of a whole cylinder of the gas, plotting the results obtained from these samples on rectangular diagram paper and calculating percentages from the areas so obtained.

	From Inverted Cylinder	From Diagram
Per cent. O_2	1.1	1.0
Per cent. N_2	3.1	3.3
Per cent. N_2O	95.8	95.7

Oxygen was determined by absorption with pyrogallate, nitrous oxide by explosion with hydrogen, and nitrogen by difference. No impurity other than oxygen and nitrogen was detected in the cylinders examined except in one specimen which contained a small amount of carbon dioxide.

The variation in composition in the gas as drawn from the cylinder must be of significance in the administration of the gas, and the method of getting a fair sample should be applicable to other liquefied gases such as carbon dioxide and ammonia.

A Differential Test for Chloride and Dioxide Substitutes: CHAS. P. FOX, Akron, Ohio.

The reclaimed rubber trade recognizes two grades or varieties of *"so-called"* substitutes. These substitutes have their origin in certain very soft rubbers which have been *firmed* or *hardened* by action of chemicals. They are known as "chloride" or "dioxide" substitutes. Often it is interesting and valuable to trace the method of manufacture of these grades. The following method suffices:

Fuse in a large *nickel* crucible a mixture consisting of *sodium* or *potassium hydrate* and *potassium nitrate* (1 to 5). Add the rubber, in fine pieces, slowly, using cover on crucible and continuing fusion until a white mass, on cooling, is obtained. Cool; dissolve in hot water, acidify with nitric acid, boil thoroughly to expel carbon dioxide and nitrous acid fumes and filter. Add to filtrate excess of *barium nitrate;* a white precipitate indicates sulphur. Remove the barium sulphate by careful filtration and add *silver nitrate;* a white precipitate shows presence of *chlorine.* The presence of both of these precipitates indicates a chloride substitute. The presence of sulphur alone gives the clue to a sulphur dioxide production.

By using *one* gram of the substance and 10 grams of the fusing mixture the test is easily carried out with definite results. A blank test should always be conducted with the reagents, especially those concerned in the fusion operation. In most cases the blank test will give an opalescence with the silver solution. However, if the amount stated has been used and chlorine be present the precipitate will be heavy enough to remove all doubts.

Marine Fiber: CHAS. P. FOX.

American Consul John F. Newell, at Melbourne, Australia, has recently called attention to the use of a seaweed fiber in the manufacture of textiles. This fiber has its origin in the leaves and stems of *Posidenia Australis.* Large quantities of this fiber are found in Spencer Gulf. According to the Jewell report, extensive deposits ranging from four to twelve feet in thickness are found, in shallow water, mixed with clay and sand and shells. The material is dredged, roughly dried on the beach, and then transported to the factory, where it is cleaned, sorted and baled.

The raw material is light brown, resembling unbleached flax fiber. Fiber mixed with numerous pieces of flat, satin-like leaves. The separate fibers vary in length from one to six inches. They are firm, smooth and only of slight strength. This fiber finds a use in the manufacture of certain classes of woolens. When mixed with wool it is said to weave and dye better than cotton and to be much cheaper.

Through the kindness of Mr. Holweeay, of Brown & Dureau, Melbourne, we have examined samples of the crude fiber and of cloth containing one third marine fiber, one third wool and one third cotton. In weaving, Lincoln or Crossbred wool gives better results than Merino.

This fabric weighs 8 oz. per square yard and gives a tensile, per 1 in. width, of 22 lbs. for both filler and warp.

A Method of Analysis of Lead Ores: JOHN WADDELL.

This paper gives details of a method of determining lead in ores, especially those rich in lime.

The method consists in precipitating the lead as chromate, which, when dissolved in hydrochloric acid, liberates iodine from potassium iodide and the iodine is titrated with sodium thiosulphate.

A Method of Analyzing some Commercial Gold Alloys: JAMES O. HANDY.

Gold alloys containing Au, Ag, Cu, Zn and Sn are reduced to filings for analysis.

0.5 gram is dissolved in aqua regia, 4 HCl: 1 HNO_3. The excess of acid is boiled off, the liquid is diluted and AgCl precipitated by boiling. Filter, wash, dry and weigh.

Filtrate plus 5 per cent. of concentrated HCl, is treated with H_2S. In the filtrate from the sulphides, the Zn is separated as carbonate and weighed as oxide.

The SnS is dissolved out of the sulphide precipitate by 30 per cent. HCl, and is again precipitated as SnS after nearly neutralizing with ammonia. Weigh as oxide.

The Cu is dissolved out of the Au + CuO mixture obtained by burning off the sulphides of gold and copper. Concentrated HNO_3 is used. H_2SO_4 is added and the HNO_3 boiled off. After cooling, water and sodium acetate are added. Boil, cool, add KI and titrate Cu by hyposulphite.

Au and Ag are determined by scorification with lead and borax—silica flux. A "control" assay to check losses of Au and Ag is run with a mixture of metals of approximately the formula of the alloy itself. The Au and Ag are determined together and then separated in the usual manner. Results by corrected fire-assay are more exact than by wet methods in most hands.

Alloys of gold containing up to 26 per cent. Ag, 18 per cent. Cu, 7.5 per cent. Zn and 2 per cent. Sn have been successfully analyzed by this method.

Concentration and Purification of Iron Ore, High in Sulphur, by Roasting in a Rotary Kiln: JAMES O. HANDY.

DIVISION OF FERTILIZER CHEMISTRY

Paul Rudnick, *chairman*

J. E. Breckenridge, *secretary*

Note on the Neutral Permanganate Method for the Availability of Organic Nitrogen: JOHN PHILLIPS STREET.

Further tests with experimental mixtures, in which the permanganate availability of the nitrogenous material was known, showed that under certain conditions very misleading results were obtained, particularly with certain high-grade ammoniates like dried blood. Investigation showed that muriate of potash had no effect on the availability results, but that as the relative amount of acid phosphate was increased the availability of the nitrogenous material decreased, for instance, dried blood from 97 to 59 and tankage from 91 to 78. It was found that the addition of one gram of sodium carbonate prior to the introduction of the permanganate solution gave results close to theory with all the materials tested, except garbage tankage which gave somewhat high results, but not high enough to lead to erroneous interpretation of the analysis.

The Use of Fused Silica Dishes for Potash Determination in Fertilizers: W. D. RICHARDSON.

The Availability of the Insoluble Nitrogen in Certain Commercial Fertilizers: B. L. HARTWELL and F. R. PEMBER.

Results secured by growing crops in pots showed that the insoluble nitrogen of twelve potato fertilizers made by different manufacturers must have been derived from fairly high-grade material. The availability of this nitrogen was found to be about the same both by the crop results and by the alkaline permanganate method recently adopted by certain northeastern states for the laboratory determination of the character of the materials used as sources of the insoluble nitrogen of fertilizers.

The Use of Alundum Crucibles for Total Phosphoric Acid and Potash Determinations in Fertilizers: W. D. RICHARDSON.

The Availability of Nitrogen in Complete Fertilizers: JACOB G. LIPMAN.

Notes on Estimation and Valuation of Potash: P. F. TROWBRIDGE.

Reports from the following committees were received and will be published in the *Journal of Industrial and Engineering Chemistry:* Paul Rudnick, for the committee on nitrogen; G. A. Farnham, for the committee on phosphoric acid; J. E. Breckenridge, for the committee on potash; C. F. Hagedorn, for the committee on phosphate rock; F. B. Carpenter, for the committee on fertilizer legislation.

DIVISION OF PHARMACEUTICAL CHEMISTRY

B. L. Murray, *chairman*

F. R. Eldred, *secretary*

A Few Results Obtained from Pepsin Assay: O. P. EYRE.

Observations upon the Assay of Digestive Ferments: HOWARD T. GRABER.

The three classes of organic foodstuffs considered and the rôle each plays in the nutrition of the body. Proteids are the principles from which all living cells are made, while the carbohydrates and fats serve as the natural fuel foodstuffs of the body.

Digestion considered as a chemical process and can be brought about by pure chemical means, but much more slowly than by the digestive enzymes or ferments.

Enzymatic activity considered. Characteristics peculiar to the enzymes: (1) distinctly specific in their activity, (2) their reactions are incomplete, (3) reactive to environment, (4) the *kind* of proteid, albumenoid or starch acted upon a big factor in the ultimate amount digested.

The enzyme pepsin considered; showing by experiment that the fresh egg of the epicure and housekeeper is not so easily digested as one from five days to one week old.

The enzyme pancreatin considered.

The two assays of the pharmacopœia discussed and a third assay recommended which measures the amount of steapsin or the fat splitting enzyme present.

Pancreatin is more active upon corn starch than upon potato starch.

The enzyme rennet and a method recommended for its standardization. As in the animal kingdom we have juices whose specific function is to tear asunder the food material to make it available for the needs of the body, so in the plant kingdom we find analogous enzymes whose function is exactly the same, that is, to render the plant foods assimilable. Most important of these from our standpoint are bromelin and papain. Bromelin is the enzyme existing in the fruit of the pineapple. Papain exists in the fruit of the pawpaw, a tree growing in the Bahamas and West Indies. Collection of papain described and an assay recommended by means of which the amount of raw beef digested by the papain in a definite period of time is determined.

Conclusions—(1) The composition of the white of the egg, chemically and probably even physically, when used for the assay of pepsin, has a great bearing upon the apparent strength of this ferment. The albumen seems to be more difficult to digest the first twenty-four hours after the egg is laid, and a change gradually takes place until after about five to seven days it has reached its maximum solvent condition. After this period its digestibility gradually diminishes.

(2) In the assay of pancreatin for starch hydrolysis, as well as all the diastasic ferments, the kind of starch used is of prime importance, and in stating the strength of each it should be in terms of the particular starch employed.

(3) The papain seems to be equally active on any kind of raw beef when acting in an acid media, but if the character of the beef is changed, as, for instance, by cooking, papain loses its solvent action upon the proteid.

(4) Rennet is influenced, in testing its coagulating power, by: the condition of the milk, its chemical composition such as the presence and quantities of inorganic salts, particularly those of calcium; the manner of mixing the rennet with the milk; the brand of cows from which the milk is taken, and, lastly, the temperature at which the milk was kept before using and during the test.

Pharmacopœial Revision: JOSEPH P. REMINGTON.

Investigation made with Dry Egg Albumin, in View of Replacing the Albumin Coagulated in the Egg, for Greater Accuracy in the U. S. Pharmacopœia Pepsin Assay: A. ZIMMERMAN.

Laboratory Studies of Pepsin, Pancreatin and Combinations of these Ferments: A. ZIMMERMAN.

Precipitated Sulphur, a Study of a Dermatological Prescription: EDW. KREMERS.

The Moisture Content of Drugs: EDW. KREMERS.

A Study of the Bromine and Iodometric Methods for the Determination of Resorcinol: C. M. PEIRCE.

The iodometric method is of little value. The bromine method gives good results only under certain conditions.

Too large an excess of KI causes some decomposition of tri-brom-resorcinol. Considerable dilution before addition of KI causes precipitate to dissolve, permits a rapid reversal of tri-brom-resorcinol brom and counteracts tendency for decomposition of tri-brom-resorcinol.

The bromine methods as recommended for determination of resorcinol in commercial resorcinol is briefly as follows: prepare a 500 c.c. aqueous volumetric solution containing 1.4563 g. resorcinol; withdraw 25 c.c. portions; dilute with 500 c.c. water; add 5 c.c. HCl and let set 1 minute; dilute with 200 c.c. water; add 5 c.c. KI 20 per cent. and let set 5 minutes; titrate liberated iodine with N/10 thiosulphate using starch as indicator. The number of cubic centimeters of N/10 Br consumed divided by .4 gives percentage of resorcinol.

Estimation of Morphine by Extraction with Phenyl-ethyl Alcohol: A. D. THORBURN, Indianapolis.

An aqueous solution containing morphine is made alkaline and shaken with a mixture of phenyl-ethyl alcohol and benzene; the solution of the alkaloid in phenyl-ethyl alcohol is then partially evaporated and titrated. The method is designed for quantities of sample representing less than .175 gm. anhydrous alkaloid and can be completed in about four hours.

The Relation of the Alkaloids of Gelsemium to One Another: L. E. SAYRE.

The Volatile Acidity of Tragacanth and other Gums: W. O. EMERY.

A Modified Form of Repercolation: E. G. EBERHARDT, Indianapolis, Ind.

The author discussed the advantages of repercolation, gave results obtained on cimicifuga and gentian by triple percolation, as shown by extractive determinations made in successive fractions of percolate and describes a continuous or serial method of percolation giving results obtained in its use.

Tincture Cantharides: E. G. EBERHARDT, Indianapolis, Ind.

The sparing solubility of cantharidin in alcohol makes a 10 per cent. alcoholic tincture impracticable. The author gives results obtained in various attempts to secure a full-strength tincture and gives two methods by which cantharides may be exhausted, one of these depending on the conversion of cantharidin into cantharidate, and extraction with dilute alcohol, but yielding a preparation which is but weakly irritant, the other depending on the liberation of combined cantharidin in the drug by an acid and extraction with acetone, yielding an actively vesicant preparation.

Notes on the Iodometric Determination of Strength of Formaldehyde Solutions: JOSEPH S. CHAMBERLAIN.

The Pharmacopœial Standard for Desiccated Thyroid Glands: REID HUNT and ATHERTON SEIDELL.

The Manufacture and Testing of Drugs (illustrated): W. A. PEARSON.

Acetate Collodion: EDWARD C. WORDEN.

Attention is called to the combustibility of the pharmacopœial pyroxylin, and to the inflammability of the official solvents directed to be used in the preparation of the collodions. The replacement of pyroxylin by cellulose acetate is advocated, and attention drawn to the use of acetate collodion in photography, where it has long since passed beyond the experimental stage. Uninflammable cellulose acetate combined with chloroform, carbon tetrachloride or tetrachlorethane, all of which fluids are unburnable, the author believes would result in the formation of transparent, clear, adhesive solutions, possessing all the desirable properties of the present pharmacopœial and National Formulary collodions, with entire absence of inflammability. A bibliography of 300 citations is appended.

Aromatic Spirits of Ammonia: LINWOOD A. BROWN.

Rapid Determination of Beeswax and Honey: FRED KLEIN. (Read by Frank R. Eldred.)

The Accelerating Action of Hydrochloric Acid upon the Starch-converting Properties of Pancreatin and Malt: A. ZIMMERMAN.

The Estimation of Minute Quantities of Nitroglycerine: WILBUR L. SCOVILLE.

Nitroglycerine given medicinally in doses of 1/1000 to 1/20 grain. The material used a 10 per cent. alcoholic solution or a 20 per cent. powder mixture containing some carbonated alkali. Both materials variable in strength and somewhat unstable, and a loss also occurs in the process of manufacturing, so that an accurate and reliable method of estimation in mixtures is needed. The alkaline-titration method of no value. The nitrometer requires special skill for good results.

By the use of phenoldisulphonic acid colorimetrically, as in the estimation of nitrates in water, quantitites of 1/100 grain or less can be accurately estimated. The process is rapid and requires no special skill. It is particularly adapted to the estimation of nitroglycerine in tablets, pills, solutions, etc.

The Determination of Camphor in Spirits of Camphor: L. D. HAVENHILL.

A New and Accurate Method for Determining the Tryptic Value of Pancreatin: C. F. RAMSAY.

The U. S. P. method for testing pancreatin on milk is indefinite and inaccurate because of the end reaction. By the use of rennin for determining when the milk has been peptonized, an accurate method for determining the tryptic value of pancreatin has been worked out.

Commercial samples of pancreatin are found to vary in strength from 1:120 to 1:1,750.

(*To be continued*)